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Denmark's Changing Livestock and Feed Situation



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This week's cover:

Swine and poultry feeding in Denmark. Story beginning this page details the country's changing supply situation for feed.

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By MARSHALL H. COHEN
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Denmark, which once imported much of its animal feed, is increasingly meeting its feed requirements from homegrown supplies. There have been many reasons for this development—including shifts in area from breadgrains to certain feedgrains, improved feeding technology, and lower demand for feed because of declining animal numbers.

The decline in number of animals largely results from difficulties in export markets which have prevailed for many categories of agricultural products in recent years. Although Danish farmers rank among the world's most efficient agricultural producers, Denmark has had difficulty exploiting this comparative advantage in export markets. Exports of beef and veal, live animals, eggs, and poultry have declined sharply, particularly to EC markets since the inception of the Common Agricultural Policy in 1962.

Since about two-thirds of Danish livestock production is exported, output is being adjusted in response to these trade developments. Exports of agricultural products have been accounting for over 40 percent of Denmark's foreign exchange earnings. While total export earnings have declined, domestic



Livestock-and-Feed Situation

farm production costs have soared, particularly for machinery, fuel, fertilizer, and feed.

Cattle numbers drop

In July 1966 cattle totaled 3.37 million head. By July 1967 the numbers had declined to 3.28 million and by July 1968 they were 3.15 million, lowest in over a decade.

Cattle numbers would probably rise if the raising of specialized beef cattle should become more important. But, despite gradual increases in beef and veal production since the late 1950's, beef and veal production is still largely a byproduct of dairying; milk cows account for about 40 percent of total cattle. Furthermore, price-support programs have, in a sense, discriminated against beef and veal production by affording producers relatively higher prices for grains and dairy products than for beef and veal.

Two other developments could result in a buildup in cattle herds: (1) Danish membership in an expanded European Community (or a decline in EC levies) could result in an increase of live animal and animal product exports to that area; (2) a strengthening in butter prices in the annual quota agreement between Denmark and the United Kingdom could improve receipts from export sales of butter.

Danish government representatives have complained that butter prices have not kept pace with production costs in Denmark; in fact they have trended lower during 1964-68.

A reduction in Danish farm numbers is another reason cattle numbers have decreased. The number of farms and the supply of farm labor have declined as industrial activity and urbanization have increased. About 80 percent of farms keep cattle, a percentage that has not changed significantly in recent years. In 1967 about 128,000 farms had cattle, compared with 158,000 farms in 1962.

Downtrend in hog numbers arrested

Hog numbers have also declined in recent years—particularly since 1965 when a record high of 8.6 million hogs was

reached. By July 1967 hogs numbered around 8.5 million, and in 1968 they declined to 7.9 million. A 6-year low of 7.7 million hogs was recorded in the January 1969 census; this compared with 8.0 million hogs in January 1968. Although some of the decline may have reflected cyclical lows at the time of the census, several other important factors were involved. First, the profit margin for hog raising was narrowed by the 1967 currency devaluations in the United Kingdom and Denmark, which resulted in lower export prices; second, grain policy in Denmark had been designed to restrain hog production in order to avoid troublesome pork surpluses.

The downtrend in hog numbers appears to have ended. Demand for pork products—especially canned hams—has been strong in 1968-69, and processors have complained of scarce supplies. A strengthening of pork prices and a decline in prices of feed, particularly barley, should also contribute to an upswing in production. In March 1969 barley prices were 20 percent below average 1968 prices and 15 percent below the 1963-67 average. In January 1969 pork prices (Copenhagen wholesale prices) were about 7 percent above average 1968 prices. Rising sow numbers in early 1969 are another indication of a resumption of increases in pork production.

Demand projections estimate that pork consumption in both Denmark and the United Kingdom is likely to increase. The United Kingdom is expected to continue to purchase about half of Denmark's pork under quantitative agreement; in the most recent 3-year agreement, effective from 1969, Denmark's share of the U.K. market apparently will be maintained. Some export diversification of both live hog and pork production has also occurred. Thus, pork is likely to continue to be a key export earner.

Poultry production is another story. Poultry numbers have declined sharply in recent years. According to census data for July, poultry numbers decreased from about 26 million in 1960-64 to around 18 million in 1968. Total egg production, which was nearly 120,000 tons in 1960-64, dropped to 87,000 tons in 1968. Production of poultry meat, which reached a

At left and below, three of Denmark's most important animal feeds—hay, beets, and barley. By 1970, Denmark expects to be self-sufficient in barley, the country's leading feedgrain by far. It is likely that feed beets and hay crops will decline.



peak of 76,000 tons in 1964, declined to 65,000 tons in 1968.

Since roughly two-thirds of poultry production is exported, the loss of markets in Western Europe (especially in the European Community) and lower export prices have been largely responsible for the decline in production. Poultry production has been one of the least profitable segments in Danish agriculture, and producers have had difficulty in meeting costs. In 1967, for example, producer prices (excluding receipts from various supports) were about the same as total costs, or 19 cents per pound. Producers receive a "pooled" price, which averages prices received from exports and from sales on the home market. The home market price is fixed periodically by the government, while the export price is determined by conditions in the world market.

Since the inception of this home market scheme the home market price has increased annually, the export price, except for 1966, has declined each year. Thus, that part of total production for export has been described as "loss-incurring," and a higher domestic price has been necessary to sustain higher producer prices. Many Danish authorities are encouraging a modification of this so-called bankruptcy policy, and it is likely that production, particularly for export, will continue to be curtailed.

Emphasis on barley

The previously mentioned changes in Danish livestock and poultry have been reflected in the supply and utilization of feeds. Denmark is currently over 70 percent self-sufficient in feeds, relying largely on domestically produced barley, oats, roughages (mainly root and grass crops), skim milk, and nonfat dry milk, and on imported oilcake and oilseeds.

In recent years, Denmark has expanded both area and production of barley, the country's most important feedgrain by far. Since 1950, total utilization of homegrown barley has increased steadily along with the generally expansive hog sector. Barley utilization increased from slightly more than half of total feedgrain use in the early 1960's to about 70 percent in 1967.

Denmark expects to be self-sufficient in barley by 1970. Barley imports, which average between 10 and 15 percent of total requirements in the late 1950's and early 1960's, have declined to less than 10 percent in the past 2 years. Malting barley is exported to West Germany; such exports usually account for about 5 to 8 percent of Denmark's total barley production. Barley area increased from slightly above 2 million acres in 1960-64 to over 3 million acres in 1968—approximately 50 percent. Barley production in 1968 was over 5 million tons, compared with 3.2 million tons in 1960-64.

Barley experimentation has been intensive in Denmark, partly because of frequent trouble with mildew. As a result, new varieties—such as Emir, which is resistant to mildew and ripens early compared with other varieties—have been put on the market.

In recent years, oat acreage and production have increased sharply, reversing a declining trend since 1950 that accompanied the sharp decline in numbers of horses. In 1968, the area planted to oats was 538,678 acres and production was 861,000 tons; in 1960-64, oat acreage had been around 470,000 and production average 693,000 tons. Utilization of oats in cattle feed increased by about 40 percent from the early 1960's to 1967, when it amounted to 780,000 tons; oats account for about 14 percent of Denmark's total feedgrain utilization.

The use of roughage crops as feed has not changed significantly in recent years. However, because of higher crop yields and fewer cattle, it is likely that the areas planted to feed root crops, such as feed beets, and hay crops will decline.

Breadgrains—wheat and rye—have been fed only in small quantities in recent years. In 1968, Denmark produced a surplus of wheat and diverted some of it to feed use.

A new development in Denmark is the increased interest in growing high-protein feed pulses. In an effort to reduce imports of protein supplements, the Danes are attempting to grow such import-substituting feed as horsebeans. According to results of some Danish experiments, about 15 percent of the concentrates used for cattle and hog feed could be provided by horsebeans. Normally, pulse acreage has been an insignificant percentage of total arable land area—about 7,400 acres in 1966, and historically about 12,500 to 25,000 acres. Principally because of horsebean prospects, a projected increase to 37,000 acres by 1970 has been forecast. Longer range forecasts estimate a possible increase to around 148,000 acres.

Corn is not grown in Denmark and is imported mainly for use in poultry rations. Domestic requirements have declined with the reduction in poultry numbers. Corn use as feed was about 138,000 tons in 1968, 252,000 tons a year earlier.

Despite growing self-sufficiency in feed, Denmark depends on imports to satisfy most of its oilcake requirements, especially for dairy cattle feeds. Oilseeds and oilcake and meal represent about 85 percent of all imported feed. Normally about three-fourths of oilcake and meal requirements are imported; most of the remainder is produced in Danish crushing plants from imported oilseeds. About half of all domestically produced oilcake is from soybeans; nearly all the soybeans are imported from the United States. Because of declines in cattle numbers and increases in domestically produced feed, imports of soybeans and oilcake and meal have declined; they are likely to decline further. Total oilcake imports decreased by 14 percent in 1967, when total utilization of oilcake was over 1 million tons, the lowest in 5 years. Oilseed imports were lower by around 15 percent in 1968, while utilization of oilcake is estimated to have dropped to around 950,000 tons.

Future is iffy

Self-sufficiency in animal feed is very likely to continue to increase in Denmark. Expanded hog production would depend on homegrown barley, which has been increasing. Since cow numbers have declined, the demand for imported oilcakes and oilseeds has trended lower. Improved technology (and excellent weather in recent years) has resulted in higher yields of roughage crops and oats, used mostly for cattle feed. Declining poultry numbers will reduce demand for imported corn. Finally, a significant expansion in high-protein feed crops would result in greater self-sufficiency in protein supplements in the future.

Improved export possibilities for livestock and livestock products could reverse some of the aforementioned trends. However, increased exports, especially to West European markets, depend on whether Denmark will be eventually admitted to an expanded European Community or if a Nordic Union will result in accommodating arrangements for agriculture. Both developments are highly speculative at present and depend on the resolution of many policy differences between the countries involved.

From the mountains of Malawi to the high plains of Zambia, unusual weather has hampered efforts and prevented attainment of the goals set by the two countries for agricultural output.

Central Africa's Farmers Fight Poor Weather

After being hard hit by drought in the 1967-68 crop year, Zambia's and Malawi's agriculturalists now have to contend with the effects of excessive rain from January through March during the 1968-69 crop year. Estimates for most crops have had to be revised downward. Final production figures are still expected to be above those of last year in Malawi; in Zambia the situation looks less promising.

Tobacco is a major cash crop and agricultural export in both countries. The 1969 tobacco crop in Zambia was uneven in growth and caused farmers problems in management and cultivation—particularly in control of weeds, which flourished because of the unusual dampness. Yields are below average. The current output estimate for Virginia flue-cured tobacco, the bulk of Zambia's production, is 13.5 million pounds—slightly less than the 13.8 million pounds turned out in 1968, and the second smallest crop since 1962. In Malawi the total tobacco crop is now estimated at 33.8 million pounds—500,000 pounds greater than the 1968 crop but 14 percent less than the original tobacco crop forecast for 1969.

Tea is as important a crop in Malawi as tobacco. The 1969 Malawi tea crop could be the largest ever grown because of increased acreage, providing favorable growing conditions continue during the remainder of the year. In 1967 and probably in 1968 tea was Malawi's most valuable agricultural export.

Corn in good agricultural years is exported by both Zambia and Malawi as well as being used in large quantities within the countries. Corn is a staple food for much of the population.

In Malawi the 1968-69 commercial corn crop is estimated at 95,000 short tons—greater than last year's crop but less than the record 1967 harvest. Corn should maintain its position as an important agricultural export in Malawi. In past years major buyers of Malawi's corn have been the United Kingdom, where it is used to make whisky, and Turkey, where it is used chiefly as broiler feed.

Zambia's corn crop is poor this year, and production will probably be even less than last year's drought-reduced output. Estimates now are for a total harvest of about 400,000 short tons; corn marketed during the intake year 1969-70 (May-April) will probably be about 230,000 short tons compared with 280,000 short tons delivered the previous year. Domestic requirements are about 300,000 short tons. The corn deficit has already partly been made up by imports (50,000 short tons from South Africa since the beginning of the year) and will partly be offset by the substitution of other foods, such as sorghums, potatoes, and cassava.

Peanuts are expected to have a record harvest in Malawi in 1969. The commercial crop is estimated at about 50,000 short tons. Still, the crop is 30 percent less than the target for 1969. Peanuts will probably again be Malawi's third most important export in 1969. In Zambia the commercial crop of peanuts is now estimated at 10,800 short tons (shelled basis)—36 percent greater than last year's crop extremely small (because of drought) but only two-thirds of the 1967

commercial peanut output. Because of its own small harvest of crushing peanuts for oil, Zambia will probably have to import considerable quantities of oil peanuts.

Cotton is a relatively new crop to both Malawi and Zambia and acreages in both countries are being expanded. In Malawi the current seed cotton crop is estimated at 24,000 short tons—about 33,000 bales (480 lb. net) of lint and 14,000 tons of seed. Output for 1969 will be almost double that in 1968 but about 20 percent less than was planned. About half of Malawi's cottonseed is processed locally into cooking oils; the other half is distributed as free seed to farmers. The lint has been sold in previous years to the United Kingdom, and the bulk of the cottonseed cake is shipped to Rhodesia for feeding livestock. Forecasts for the Zambian cotton crop are down from 10,000 bales of cotton lint to 8,000 bales because of the heavy rains that washed off insecticides and gave weed growth a big boost. In spite of poor weather, though, Zambia's crop will be up from last year's 7,000 bales because of increased area planted.

Sugar, grown in Malawi only a few years, is estimated to have a 1969 output of 28,000 short tons—a gain of 7,000 short tons over 1968. Local sugar consumption will probably be about 24,000 tons in 1969, and a small surplus of sugar may be available for export. In Zambia this year's sugar production, now estimated at about 30,000 short tons, is a big advance over last year's output, which was the first in Zambia. The increase is due to bigger cane field area at the new Nakambala sugar plantation. Zambia's 1969 sugar production will not come up to original expectations, however, because a portion of the new cane fields were flooded by the Kafue River as a result of the unusually great rainfall. Although Zambia's sugar production is increasing rapidly, its sugar consumption is growing even faster. Zambia will need sugar imports for some years.

Rice, which had a very poor year in Malawi in 1968 because of drought, is expected to have a record harvest in that country in 1969. Estimates now are for 12,000 short tons in 1969 in contrast with 2,600 short tons in 1968. Good weather for rice, expanded area, and higher prices powered the leap in output. Malawi would like to increase its rice exports.

Tung nuts ceased to be an important agricultural commodity in Malawi in 1968-69 as two out of the three tung nut estates stopped production. The total crop now expected is 1,500 short tons of nuts, which represent an oil outturn of about 500 short tons—about one-quarter of the volume previously produced. Deteriorating world tung oil markets have discouraged output.

Bean and peas are important crops in Malawi, and combined commercial harvest figures are expected to be about 30,000 short tons in 1969—a good recovery from the drought-reduced commercial output of 11,500 short tons in 1968. Beans and peas are valuable agricultural exports from Malawi.

—Based on dispatches from CARLOS A. VIEIRA
Agricultural Officer, American Consulate General, Salisbury

Australian Citrus Production May Outpace Demand

Production of citrus fruit in Australia reached a new record last season and, following a slump this year, is expected to move on to new highs. Young trees planted during the early 1960's are now coming into production and should insure the short-term growth.

But this expansion, plotted when conditions were much more favorable than they are today, is causing producers to ponder problems arising from higher production costs and lower returns for their citrus. Production is outgrowing domestic consumption, so crop gains must be accompanied by increased sales abroad—and this calls for stepped-up promotional efforts plus competitive pricing.

Production and exports today

Australia has grown citrus since its pioneer days and has seen some dramatic spurts in production, most outstanding of which came during food-short years of the two world wars. Its latest expansion in plantings, at the first of this decade, is now moving the country into an export position and making it a potential competitor of note. As it stands now, Australia is about the fourth largest citrus producer in the Southern Hemisphere and the third largest exporter—following Brazil and South Africa.

Production in 1968-69 rose to a record 13.2 million bushels, mainly as a result of large valencia crops in New South Wales and along the Murray River. A near-record crop of navel oranges was also harvested, but lemon production was the lowest in some years as drought cut production along the coast. The grapefruit crop, too, was smaller than in 1967-68.

Last season's large harvest greatly increased export availabilities. Exports of oranges in 1968 rose to a record 1.33 million bushels, or nearly 362,000 more than in 1967. As usual, New Zealand was the top market, taking 457,000 bushels. Shipments to Malaysia and Singapore fell to 312,500 bushels, but those to Hong Kong rose to nearly 195,250. The United Kingdom continued to be the major West European market although sales to France were also quite large; other European markets were the Netherlands and Norway.

Mandarin shipments also rose sharply last season, reaching 39,500 bushels. Canada and Singapore were the top markets, taking 18,200 and 15,100 bushels.

Exports of lemons during 1968 fell slightly to about 24,300 bushels; most shipments went to Singapore. Grapefruit sales totaled about 15,500 bushels, with Singapore taking 9,300 bushels and France 5,000.

Citrus processing on the rise

With a large volume of undersized fruit available from the 1968-69 Valencia harvest, purchases by the citrus processors rose sharply last season, reaching a record level. Information made available by the Australian Citrus Growers' Federation indicate that deliveries of citrus to factories in 1968-69 totaled about 4.1 million bushels, or nearly 1 million more than in 1967 and 1.4 million more than in 1966.

Production of juice by the processing industry has risen sharply in recent years. Between 1962-63 and 1967-68, production of single-strength juice rose 20 percent to 3.6 million

gallons and that of concentrated juice climbed more than 3½-fold to 870,000. So far this increase has been taken up almost entirely by the domestic market, which has seen its consumption of processed citrus products jump from 8.9 pounds per head in 1962-63 to an estimated 16.37 in 1967-68.

Current and future outlook

In the current season, Australia will be harvesting a smaller citrus crop owing to lighter settings of Valencia and navel oranges in the inland irrigation districts and aftereffects of the drought along the coast.

Export sales can therefore be expected to ease. Greatest fall will probably be in Valencias. Shipments of navels may dip slightly, while those of other products should hold fairly steady. Most of the decline will be felt in shipments to Western Europe.

The steady upward trend in citrus plantings may have leveled out two seasons ago when area actually declined. However, the 21,000 acres planted during the early 1960's are only now beginning to bear fruit and will have a significant impact on production over the next few years. As a result, production potential in the early 1970's is estimated at about 17 million bushels, or 5 million more than harvested in recent years. The increase might comprise an extra 2.5 million bushels of navel oranges, 2 million of Valencias, 280,000 of mandarins, 380,000 of lemons, and 175,000 of grapefruit.

For processed citrus products, further growth appears in store, with most of the expanded output absorbed by the home market. This is still a high-cost industry, with production units fairly small, byproduct utilization incomplete, and prices paid for fresh fruit high by world standards. Consequently, there is limited opportunity to develop export markets other than those nearby in the Pacific.

Producers seek government help

This season's smaller crop will give producers and exporters a temporary breathing spell before the production surge begins. The citrus industry is, nonetheless, diligently seeking help in solving its forthcoming problems. It has asked the government for a stabilization scheme based on the underwriting of export returns through a guaranteed f.o.b. price or through a direct bounty payment on exports. Thus

AUSTRALIAN CITRUS PRODUCTION¹

Type of fruit	1966-67 ²	1967-68 ³	1968-69 ³	1969-70 ⁴
	1,000 bu.	1,000 bu.	1,000 bu.	1,000 bu.
Navel oranges	3,947	3,097	3,933	3,200
Valencia and other sweet oranges	6,730	6,353	7,334	6,500
Mandarins	705	882	733	800
Lemons and limes	948	904	794	800
Grapefruit	446	483	397	450
Other	5	5	5	5
Total	12,781	11,724	13,196	11,755

¹ Year beginning April 1. ² Final data Bureau of Census and Statistics. ³ Preliminary estimates. ⁴ Forecast by attaché office.

Note: Approximate weight of a bushel is 48 pounds for oranges, tangerines, lemons, and limes; 42 pounds for grapefruit.

far, however, the government has shown little enthusiasm for such programs. The industry has also asked for sales tax exemptions, increased import duties to protect the Australian juice market, continuation of sugar rebates for both domestic and export packs, control of freight costs to all export markets, and government purchases of fresh citrus or citrus juices for use in an Australia-wide school distribution program.

Australia Reaps Smaller Grain Sorghum Harvest

Drought conditions, mainly in Queensland, caused this season's Australian grain sorghum harvest to drop to between 9.5 million and 10 million bushels—from 13.5 million bushels a year ago. Although the New South Wales sorghum crop set a record of about 4 million bushels, total supplies of Australian sorghum are still below normal and grain offered on the open market is expected to sell at high prices.

At the start of the season it was estimated that grain sorghum plantings in Queensland would total at least 400,000 acres, but lack of adequate planting rains reduced this projected acreage to about 250,000 acres. Continued dry conditions, particularly in central Queensland, severely affected the crop, and fairly large areas were abandoned.

Last season, Queensland's production of grain sorghum amounted to 11.25 million bushels, harvested from 395,000 acres. This year's crop is about 5 million bushels. Because

To avoid drastic price falls on the local market, the industry realizes it must export more. However, returns from major traditional markets like New Zealand, Fiji, the United Kingdom, Mauritius, and Ceylon have been affected by the devaluation of 1967, while at the same time suppliers who devalued are in a position to undersell Australia. Hence, the current pressure for an export price support plan.

of the small harvest, the Queensland Grain Sorghum Marketing Board has decided that there will be no marketing pool or permit system operating this season. Unrestricted marketing will be permitted until December 31, with a resumption of pooling operations from January 1, 1970.

Tipperary output rises

Grain sorghum planted in the Tipperary area of the Northern Territory has yielded a satisfactory harvest of more than 590,000 bushels from 13,500 acres. However, since high freight costs will probably prevent any of this being sold on the domestic market, most of it is likely to be exported to Japan. Grain driers have been installed this year in the Tipperary area to prevent a recurrence of last year's problems with wet grain. The driers are expected to bring export grain down to acceptable moisture levels.

Biscuitmakers Seek Wheat

Spokesmen for the Australian biscuit industry have recently pointed out that the shortage of soft wheat in Australia is becoming more acute each year, mainly because farmers are encouraged to grow high-yielding crops under the fair average quality (f.a.q.) system and few of the soft wheat varieties are high yielding.

The Australian biscuit industry consumes about 3 million bushels of soft wheat per year; and according to the Chairman of the Grain Elevators Board, Mr. Hodgson, biscuit manufacturers in New South Wales alone would require 2.5 million bushels per year of the right soft wheats.

The major production districts for soft wheats are the Murray and Murrumbidgee Irrigation Areas, while Pinnacle is the best known variety. Wheat grown outside irrigation areas is not up to biscuitmaking specifications.

Despite their pleas for more locally grown soft wheat, biscuit manufacturers claim that they can't pay high premiums to induce growers in the irrigation areas to plant more of the needed varieties.

Boost in Aid for Ord Cotton

The Western Australian Government has increased its financial assistance to Ord River cotton farmers by 2.2 U.S. cents per pound of lint processed from the present crop. This increase will boost aid on the crop to a total of about US\$201,600, equal to 3.4 cents per pound of lint. In addition, the government has offered concessions on power charges amounting to about US\$16,800 and also deferment of rent on cotton gins.

Since it is harvested 3 months after the rest of the Australian crop, it is claimed that cotton in the Ord River Valley area requires special assistance. Ord River farmers face difficulties in disposing of their crop because total Australian cotton production is up this year and domestic markets have already filled their quotas from the earlier harvests.

The government had previously offered growers subsidies equivalent to 1 cent per pound, provided ginning and marketing costs were kept down. According to North-West Minister Charles Court, the State Government reviewed the growers' position and decided to increase assistance after the Federal Government had rejected a request for special area assistance to the Ord River Valley cotton growers.

Wheat Reflects Dry Weather

In spite of dry conditions which prevailed in most areas prior to and during the harvest period, the 1968-69 Australian wheat harvest was a record one of approximately 540 million bushels. The dry conditions affected the quality characteristics of the different types of wheat.

In New South Wales and Queensland the dry weather helped to maintain the protein content of the Prime Hard and New South Wales Northern f.a.q. wheat at a satisfactory level, although the grain finish was affected to a varying extent. The protein content of the soft wheat, in all States, was lower than the previous year's level.

The moisture content of the wheat was also at a low level, mostly ranging between 9.5 percent and 10.5 percent, well below the 12 percent maximum moisture content allowed for f.a.q. and other standard classes.

養満点でおいしいアメリカ



The reigning Miss Hawaii serves up her State's papaya with a dash of showmanship, at recent U.S. Food Exhibit in Tokyo.

Pioneer Promotion of Hawaiian Papayas in Japan

By GORDON S. NICKS
*Assistant U.S. Agricultural Attaché
Tokyo*

Hawaiian papaya producers launched their product on the Japanese market in late April of this year, following the lifting of a plant quarantine embargo on its entry into Japan.

The lifting of the embargo was the culmination of more than 3 years of co-operative effort by Japan's Ministry of Agriculture and Forestry, the Hawaiian Department of Agriculture, the Hawaiian papaya industry, and the U.S. Department of Agriculture.

A flying start

The first shipment of 640 cases (9,000 pounds) of papayas arrived in Tokyo in excellent condition and was put on sale immediately in department and food stores in major Japanese cities. Since the fruit is highly perishable, it must be air-shipped from Hawaii for the Japanese market.

To dramatize the first shipment, the Hawaiian papaya industry brought Deborah Gima, the current Miss Hawaii, to Japan. Accompanied by a group of Hawaiian musicians called the Papaya Sereaders, she appeared at the U.S. Food Exhibit in Tokyo, April 17-May 6, at a dozen leading department stores, and on

national television — dancing, demonstrating papaya preparation, distributing samples, and gathering columns of newspaper space.

Angel Maehara of Honolulu, spokesman for the group of Hawaiian papaya growers who accompanied the first shipment to Japan, believes that Japan can become a year-round market for this important Hawaiian fruit.

After promotional visits to Japan's three largest cities—Tokyo, Osaka, and Nagoya—Maehara said, "I believe we will develop a market over here for as much as 2,000 cases a week, in spite of high costs.

"Air freight to Japan costs us 30 cents a pound. We pay a 20-percent duty on landed cost. We also have to go through jobbers rather than being able to deal directly with the grocery chains as we do in the United States.

"This means that Japanese retailers are having to charge from \$1.25 to \$3 per papaya, depending on size. This same fruit would cost from 22 to 35 cents in our Hawaiian stores. However, the Japanese are currently paying as much as \$8 apiece for cantaloup, so they are used to high fruit prices, and there is no doubt that they like our Hawaiian papaya.

"We are already flying papaya to the east coast of the United States, and if

we can add this Far East market, it will mean much to our industry."

Shipments of fresh Hawaiian papaya to Japan have until recently been prohibited by Japan's plant quarantine laws. Japan has been concerned that the fresh papaya might introduce fruit flies.

Getting the embargo lifted

In 1966, the Hawaiian papaya industry sponsored a thorough study of Hawaii's papaya fumigation and treatment facilities by two Japanese plant quarantine officials.

As a result of that team's findings, Japan's Ministry of Agriculture and Forestry (JMAF) concluded that methods of treating papaya in Hawaii were adequate to insure against an infestation of fruit flies. In March of this year Japan's plant quarantine law was amended to permit entry of Hawaiian papaya.

In April, at the invitation of the U.S. Department of Agriculture, JMAF dispatched a Japanese plant quarantine inspector to Hawaii to supervise papaya treatment procedures on fruit destined for Japan.

Existing personnel shortages in Japan's plant quarantine service limit the stay of the Japanese inspectors in Hawaii to 4 months or less. It is hoped, however, that in the future a fulltime Japanese inspector may be dispatched to Hawaii.

United States a Major Seasoning Market

This is the first section of a two-part article on the quantities and types of seasonings imported into the United States, their origins and botanic relations, and their uses. The first section, published in this issue, is about spice imports. The second section, which will appear in the following issue of Foreign Agriculture, gives statistics about and explanations of herb, seed, and flavored vegetable imports.

Because of the varied tastes, high incomes, and tough stomachs of most U.S. citizens, the country is the world's single biggest buyer of spices, herbs, seeds, and strong-tasting vegetable substances to season foods.

The United States and the spice trade

The United States is almost wholly dependent on imports for supplies of spices. The plants from which true spices are derived will thrive only in tropical climates. U.S. imports range from exotic substances bought in small quantity, such as Spanish saffron, the world's most expensive spice (US\$90-\$100 per pound, New York, spring 1968), to substances shipped into the country in gastronomically staggering quantities when one considers their high flavor potency. An example of the latter is pepper. In 1968 over 53 million pounds of black and white pepper arrived in the United States—enough to supply every man, woman, and child in the country with a quarter of a pound.

Total U.S. spice imports for 1968 were worth around \$37 million—or about three-fourths of 1 percent of total agricultural imports for the year (about \$5 billion worth of goods). Economically, the spice trade is a midget in the United States—but for people's tastes it is a very important midget. Without it there would be no vanilla to put in ice cream, no ginger with which to make ginger ale, and no pepper for its innumerable uses.

Rapid shifts in spice supplies

A picture of U.S. spice imports in relation to world production and trade is hard to get in focus because of the difficulty in obtaining accurate statistics from many countries. The problem is aggravated by discrepancies in nomenclature within the spice trade and among reported statistics, by re-exports by some countries, by unreported exports and imports, and by unknown consumption within some producing countries.

In addition, supplies of spices may be erratic from year to year in major producing countries because of weather disturbances, plant diseases, pest attacks, small production because of particularly low prices, or speculative holding of short crops. Prices of many substances are subject to wide fluctuations. And countries that have been traditional producers, exporters, and suppliers of the United States may temporarily drop from the picture because of climatic, political, financial, or other adversities and be replaced by more fortunate competitors.

Spice suppliers and situations

All spices are derived from aromatic parts of tropical plants. The spices imported in quantity to the United States

are allspice (also called pimento), cardamon seed, cassia and cinnamon (both called cinnamon in the United States), cloves, ginger, nutmeg and mace (different parts of the same plant), pepper, turmeric, and vanilla beans. Several of these names have variant spellings.

Allspice gets its English name because it smells something like a combination of cloves, cinnamon, and nutmeg. It is one of the two important spices native to the Western Hemisphere, and it is still grown chiefly in the Caribbean area. The major supplier to the United States in 1968 and 1967 was Jamaica. In 1968 sales from all sources to the United States were a little over 1 million pounds. Allspice is used in commercial and home baking of cakes, cookies, and pies and by commercial picklers.

Cardamon is the tiny, black seeds of a fruit from a plant related to ginger that is native to India but is now grown in both Asia and Central America. Cardamon is used in baked goods, and all authentic Danish pastry contains cardamon. Guatemala is the chief U.S. supplier, and India is also an important source. Cardamon is a high-priced (US\$2 to \$5 per pound unprocessed), low-volume sales item, and in 1968 total U.S. imports were 117,700 pounds.

Cinnamon and cassia are both marketed as cinnamon in the United States and come from the bark of related trees of the laurel family. Cassia comes from trees that grow in southeast Asia; cinnamon from trees from Ceylon and India west to the east coast of Africa.

Cassia and cinnamon are used in the United States for a variety of purposes. They are much utilized in baked goods, to flavor chocolate, to flavor chewing gum, dentifrices, medicines, liqueurs, and nonalcoholic beverages, and for pickling. Cinnamon is also used in some perfumes. In 1968 total U.S. imports of cassia were close to 9 million pounds, nearly all of which came from Indonesia. For the same year, cinnamon imports were a little over 5 million pounds, and the Seychelles were the major supplier with Ceylon the only other important source. Next to pepper and vanilla beans, cinnamon and cassia together are the most valuable spice imports of the United States.

Cinnamon and cassia have both undergone extreme fluctuations in price and supply in recent years. One of the chief exporters of cassia used to be Mainland China; it has almost ceased foreign sales, sharply lowering international supplies and driving up prices.

Mainly due to the activities of speculators, cinnamon prices shot up during the 1950's, and they are still something of an anomaly on the world market. In 1967 cinnamon from Ceylon cost U.S. importers an average of \$1.15 per pound; cinnamon from the Seychelles averaged \$0.14 a pound. Prices in 1968 were a little more even, but not much. Cassia, which for years was lower priced than cinnamon, averaged \$0.62 per pound for U.S. imports from Indonesia in 1968.

Cloves are the dried flower buds of a tropical evergreen tree native to eastern Indonesia. In 1968 nearly 4 million pounds of cloves were imported by the United States; the Malagasy Republic was the chief supplier, and the island of Zanzibar was the next most important source. In the United States

whole cloves are used in pickling and preserving, making catsup, and as a garnish for hams. Ground cloves are used in many baked goods and in chocolate and other desserts. Clove oil is used to flavor chewing gum and candy, in pharmaceutical preparations, and in perfume and soap.

In recent months clove supplies have become very short because of a poor crop in Zanzibar in 1968-69, and prices have skyrocketed. New York wholesale prices are now about \$1.75 per pound compared to \$0.38 per pound a year ago. The 1969-70 crop in Zanzibar is also expected to be below average so that prices will probably continue high.

Ginger is imported into the United States in the form of roots (technically rhizomes). The chief suppliers in 1968 were Nigeria, Sierra Leone, the Fiji Islands, and Jamaica, in that order, and total U.S. imports were nearly 3.6 million pounds. Ginger is widely used by U.S. bakers in gingerbread, cookies, and other confectionery products. Large amounts are used in making ginger ale and lesser quantities in pickling, meat preserving, and sirup making. Both ginger and its essential oil are used in toilet and medicinal preparations.

Nutmeg and mace both come from a tropical evergreen tree. Nutmeg is the pit or seed of the fruit, and mace comes from a thin, fleshy network (the aril) surrounding the pit. Because there is much more of the pit than the aril, nutmeg is a larger volume item of spice commerce than mace and is lower priced. The two major sellers of nutmeg to the United States are Indonesia and the island of Grenada in the Caribbean, in that order. They are also the two major growers of nutmeg in the world. Total U.S. imports of nutmeg in 1968 were 4.1 million pounds. Indonesia has been the only important source of mace for the United States for several years, and in 1968 total U.S. imports were 502,900 pounds.

Nutmeg is used in a variety of baked goods and sweets and in the seasoning of processed meats; mace is most used in baking and in flavoring meat dishes. Both nutmeg and mace yield an oil that is used in perfumes and pharmaceutical products.

Supplies and prices of nutmeg and mace have been variable in recent years because of fluctuating world production. Several times in the last 20 years Grenada has had its nutmeg trees seriously damaged by hurricanes.

Pepper is the dried berry of a tropical vine. Its trade dwarfs that of other spices both in the United States and in the world. In 1968 U.S. pepper imports were about one-third of net world imports. Nearly every U.S. household uses pepper, and (except for Tunisians and Moroccans) U.S. citizens are the biggest pepper eaters in the world.

The pattern of pepper exports and sales to the United States has been changing. After World War II and until the mid-1950's, India was the major supplier of the United States. But India's pepper exports in recent years to the United States have skidded, chiefly because U.S. importers have been buying lower priced pepper from other sources, until it is a minor U.S. supplier (about 2.6 million pounds in 1968). The big gainer has been Indonesia, which in 1968 sold a little over 38 million pounds of pepper to the United States. Another important U.S. supplier is Brazil, which has been increasing its pepper production and U.S. sales.

At present pepper is chiefly used in the United States as a seasoning for freshly cooked or prepared food. Its once important use as a food preservative has largely ceased. Although pepper imports to the United States are slowly

expanding because of increased population, use per person has decreased since World War II—perhaps in part because of greater use of precooked and convenience foods that are often lightly seasoned and to which consumers do not tend to add pepper.

Turmeric is derived from the aromatic roots of a plant related to ginger. The chief U.S. suppliers in 1968 were India (nearly 2.5 million pounds) and Jamaica (467,300 pounds). Total U.S. imports for the year were nearly 3.4 million pounds. Turmeric is used chiefly in the United States as an ingredient in curry powder, prepared mustards, and mustard pickles.

Vanilla beans are the fruits of a climbing orchid native to Central America and the Caribbean. Vanilla is used in the United States for flavoring ice cream, chocolate, candies of many types, beverages, and for fragrance in soaps and perfumes. In 1968 total U.S. vanilla imports were nearly 2.2 million pounds, almost all of which came from the Malagasy Republic and the Indian Ocean islands of Réunion and Comoro. Minor suppliers were Mexico and Indonesia. The United States usually buys around two-thirds of world vanilla exports each year.

Over the years, U.S. vanilla imports have failed to expand because of the high prices of vanilla beans (from \$15 per pound in 1960 to \$5.62 per pound in 1968) and because of the increasing use of synthetic products, such as vanillin, which can be manufactured from the waste sulfite liquor of papermills, from coal tars, or from clove oil. Synthetics are much cheaper than vanilla beans.

Curry powder is a blend of spices, ground seeds, and other substances. Total U.S. imports of such blends in 1968 were 60,500 pounds, and the chief supplier was India. Formulas for curry powder are innumerable, but nearly all of them call for ginger, turmeric, fenugreek seed, cloves, cinnamon, cumin seed, pepper, and capsicum peppers.—F.N.P.

Malawi's Agricultural Census

A national census is underway in Malawi to obtain facts and figures on agricultural production. Information is being collected on types of crops grown, volumes of crops, amounts sold and traded, transportation of farm goods to market, values of farm-product sales, expenditures on agricultural inputs, livestock numbers, machinery and equipment presently in use, and food consumed by farmers. The completed census will provide economic planners and agricultural experts with a basis for formulating agricultural improvements.

The first phase, which is nearly completed, involved selecting a sample of farmers in the various areas of Malawi, measuring their fields, determining the crops they grew, and surveying small census plots in peanut and corn fields. During the second phase, produce from the small plots will be harvested and measured to provide figures from which to estimate total production of corn and peanuts in Malawi.

Field census work, which began last November, is close to schedule but was delayed early this year by unusually heavy rains that made accurate measurements in sodden fields difficult and closed roads to some rural areas. If phases after the first and second do not meet with unusual delay, a preliminary report will be issued early in 1970. The final report, which will contain data for each political subdivision and 35 agricultural-ecologic zones plus national totals, should be completed by late 1970.

Drought Cuts South African Corn and Sorghum

By ROGER F. PUTERBAUGH

Grain and Feed Division

Foreign Agricultural Service

Although a severe 3-month drought in South Africa was alleviated by March and April rains, it still reduced harvest prospects for corn and sorghum. The harvest begins in May and continues through August and, while the rains prevented complete crop failure in many areas, it is still unknown to what extent they revived the drought-damaged plants. Small grains, planted in the winter or early spring, however, were not affected; in fact, a record wheat crop was harvested. Total domestic grain consumption will be higher because of the drought-reduced forage and locally grown vegetable supplies.

Most grain prices for the 1968-69 season were unchanged, but minimum prices per bag to be paid to farmers for corn have been increased by 30 cents and for sorghum by 70 cents. The new prices on a metric ton basis will be \$50.90 for corn and \$61.73 for sorghum.

Drought reduces exports

Due to the smaller corn and sorghum harvests, the large export program of the past 2 years has been discontinued. Export sales of white corn stopped in November and export sales of yellow corn ceased in February. From a supply-distribution point of view no corn or sorghum should be available for export during 1969-70; however, some observers predict that limited exports will occur to protect traditional markets.

About 270,000 to 450,000 metric tons of corn may have to be imported to maintain minimum stocks of 725,000 to 900,000 metric tons. If corn is imported, it will probably come from Rhodesia. If the Mealie Board decides to export corn to protect traditional markets, then imports will have to be increased, stocks reduced, or domestic consumption curtailed.

Exports of sorghum declined from a record 372,000 tons in 1967-68 to 109,000 tons this season. No exports are anticipated during the coming season. Some sorghum may have to be imported if the crop is below present official estimates.

Because of the record harvest, imports of wheat will probably be limited to small quantities for blending purposes. Im-

ports of barley and rye will continue since production is not large enough to meet domestic consumption needs. Oats, however, are in excess supply and a limited quantity will be available for export.

Corn production estimate

The latest official estimate for the 1968-69 corn crop is 4,921,000 metric tons, slightly higher than some private forecasts. The long-term expansion trend in acreage was somewhat reversed in 1968-69, as area was reduced about 2 percent. The acreage devoted by Africans to corn held about steady.

The large corn exports of the past 2 years were made possible mainly by the record crop of 1967, since production during 1968 only slightly exceeded domestic consumption.

Grain sorghum consumption up

Although some observers predict the drought-stricken grain sorghum crop will be less than 181,000 metric tons, the latest official estimate is for a harvest of about 218,000 metric tons. Domestic consumption will be higher since more sorghum is being used for livestock feed and there is a steadily increasing demand by the African population who use sorghum for making beer. The brewing process starts by sprouting the grain.

Since last year's acreage of sorghum was cut about in half and there was only

a slight increase this season, the record sorghum crop harvested in 1967 provided the exportable surplus for both the marketing year 1967-68 and this year. As the low 1968-69 production will hardly cover expected domestic requirements, some grain sorghum may have to be imported.

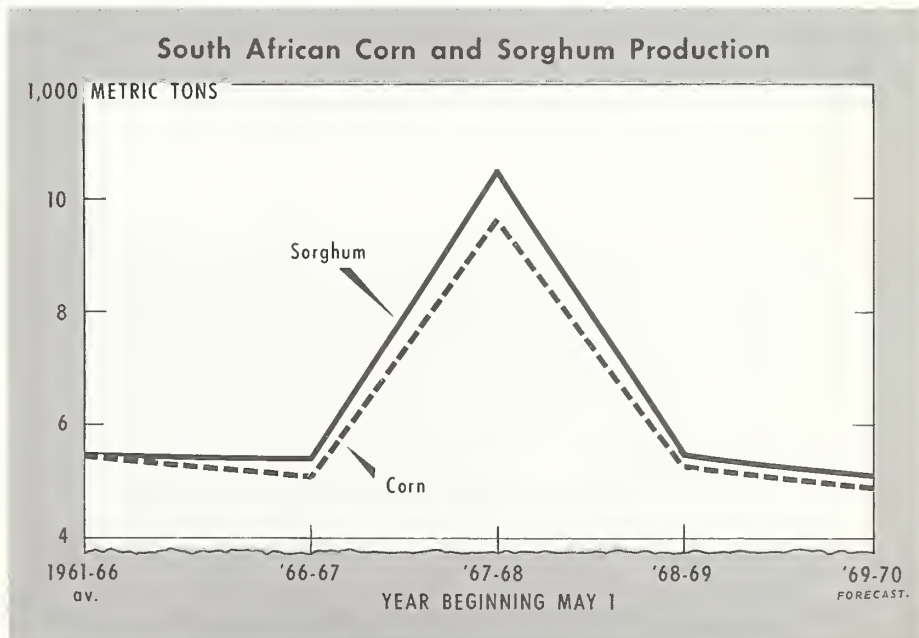
Record wheat production

A record acreage was planted to wheat this year, and production also set a new record of 1,224,690 metric tons. This compares with 1,088,620 metric tons harvested a year earlier. Production this season is about in line with domestic consumption and probably only a limited amount of wheat will continue to be imported for blending purposes from former British trust territories and other countries. The wheat crop, because it was planted earlier than corn and sorghum, was not affected by the drought.

Rye, barley, and oats

The rye and barley crops were about normal this season. South Africa is not self-sufficient in these two grains and quantities necessary to meet domestic requirements are being imported. Recent imports have averaged about 13,000 tons per year for rye and 45,600 tons for barley.

A good crop of oats was harvested this season and an exportable surplus is available.



Overseas Food Buyers Hear the Future of Air Freight

Excerpts from a presentation by Frank J. Black, Manager, Air Freight Service, Air Transport Association of America (representing the Air Freight Marketing Group), to the Overseas Executive Food Buyers Conference, Atlantic City, N. J., May 13, 1969.

The future of air freight is clearly visible today. We can see it all about us—the many different firms and varieties of shippers, each with an individual set of distribution problems, which are presently using what is not just another method of transportation, but a transport service within a marketing concept.

Jet lift for freight, as for passengers, is growing worldwide in volume, speed, and frequency of service. By January 1, 1971, there will be 365 jet-powered freighters on the line. Beyond 1971 you will see the advent of even larger, faster freighter jets, each carrying 100 tons or more of freight and using containers compatible with most of the large containers used today in intermodal transport, which have been standardized worldwide for surface modes.

The jumbo jet freighters will create the “third wave of the jet revolution in freight distribution.” This third wave will surge over the airlines of the world with a powerful force that will change the basis of our freight business and the techniques for its successful management.

Before the next decade is out, there will be vertical aircraft also capable of carrying intermodal containers.

It is because of the high rate of acceptance—for instance, by the perishables industries and other growth industries—that the air freight industry can talk and plan for investment in new and more efficient aircraft, terminals, and equipment. One evidence of this acceptance is the fact that total air freight has been doubling once every 4 years.

What about ground handling?

The technological progress in the development of fast, efficient jet freighter aircraft has, up to this time, far outpaced the development of efficient ground handling systems. But in the last few years the airlines have been rapidly building new, modern, mechanized freight terminals tailored to shipping area requirements and designed for the expedited movement of freight. Whole new families of mobile lifts, pallet trans-

porters, and planeside loaders have been produced.

Of prime importance is the current development of the electronic data processing system, which will reduce paperwork to a minimum, provide a positive means of tracing shipments, automatically rate shipments by destination or commodity classification, and provide system on-hand reports at any instant. Complete knowledge of the volume and movement of air freight on thousands of departures each day to hundreds of destinations will permit better utilization of aircraft cube and sales effort.

What about cost reduction?

Generally speaking, the commodities the airlines carry cover manufactured items, agricultural goods and a significant volume of animals and animal products, and products of the forest. We look to an expansion of present commodities by “regular users” as lift capability and flexibility expands. We look to new products as a result of research and development. With lower direct operating costs and efficiencies in terminal handling, we look for lower indirect operating costs. This combination should permit adjustments to rates, which in turn will attract commodities previously carried by truck.

As the growth in air freight volume increases as a result of schedules, jet speed, capacity, and markets covered with selective pricing at profitable levels, the upward slope of the air freight density curve will become progressively steeper. Further efficient load utilization through containerization and the application of intermodal transportation will contribute to an increase in average density. Distance, too, will become a factor, and we know that in the race for distant markets the truck will be hard put to it to match the capacity, speed, and operating efficiency of the jet.

Line-haul equipment can be considered as operating in three stage lengths. The long-haul stage tends to be a trunk-line type of service utilizing the largest and most economical aircraft available.

The first of the new jumbos to go into service most certainly will be the Boeing 747. This will be followed by an even larger aircraft such as the Lockheed L-500, which can actually accommodate shipments almost 19 feet wide and 13½ feet high. McDonnell Douglas has re-

cently announced plans for two more jumbo jets—the largest with even greater capacity than the L-500—the C-4 and C-6.

As for capacity and economic capability, the 747 will carry 115 short tons of cargo at a probable direct operating cost of 2.5 cents per short ton statute mile, whereas the L-500 can carry 165 short tons at an operating expense approaching 2.0 cents.

Medium-range aircraft tend to serve as aerial bridges between short-haul and long-haul equipment. Among the new medium-range aircraft will be the Lockheed L-1011 and DC-10.

Short-haul aircraft, except where they traverse geographical areas such as water and areas where few roads or railways exist, must compete with surface vehicles.

There will be V/STOL (vertical or short takeoff and landing) aircraft such as the Breguet 941, the Sikorsky S-64 Skycrane and others typified by the Boeing-Vertol Model 297, the Sikorsky S-65, and the Lockheed series of rigid-rotor compound aircraft.

It is doubtful that aircraft on the shorter haul segments will win out over surface vehicles when evaluated strictly on a cost per ton-mile basis. Air can and will prove feasible, however, when this service is considered as a feeder to and from the longer flight segments.

In addition to more modern and more efficient aircraft, the industry will require more automated terminals both at airports and perhaps even at locations away from airports but convenient to surface transport connections.

The successful development of air cargo rests upon a single word—one that is so very full of meaning in this age of automation—“standardization.” Without it, we would be in a completely untenable and uneconomic position.

What about other developments?

Here are some other cargo developments, covering the extent of growth and the problems of growth.

Since the start of air freight services, the truck has provided the link between the shipper and the airport terminal. For the airlines, the truck has been the umbilical cord of the jet freighter. Every day our pickup and delivery service, as well as our air/truck service, demon-

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Wide Representation at Food Buyers' Conference

The Overseas Executive Food Buyers' Conference held in Atlantic City, N. J., last month attracted importers and supermarket executives from 24 countries representing most major geographical areas of the world. Of particular interest to the visitors was the food and food equipment exhibition set up by some 600 American firms as part of the 32d Annual Convention and Educational Exposition of the Super Market Institute. Pictured here are some of the 112 foreign buyers as they inspected the exhibits and discussed U.S. foods with American industry and government officials.

By the end of the Conference, some definite preferences on the part of the foreign buyers became evident. Canned and fresh fruits and vegetables and fruit juices—canned, frozen, and bottled—attracted wide attention. New snack foods—crackers, and various corn products—were particularly attractive to European buyers, as were many kinds of frozen foods. Following the Conference, many of the visitors toured U.S. food firms and supermarkets, seeking new products and marketing ideas.



Right, J. Phil Campbell (l.), Under Secretary of Agriculture, chats with Venezuelan buyers; left, television's Art Linkletter explains new frozen pizza to Italian group.



Right, Japanese buyers, members of largest delegation to attend Conference, discuss cereals with Kellogg's Robert Bland (second from left).



Below left, food buyer from Libya (r.) reviews large selection of crackers offered by a U.S. firm; right, visitors from Brazil admire quality fruits.



Containerizing Perishables for International Trade

Now well into the container revolution, U.S. producers and shippers of perishable foods are beginning to realize that this new technique has raised new problems. Speaking to the Overseas Executive Food Buyers' Conference at Atlantic City last month, J. L. Clark of Sea-Land Service, Inc., outlined five major problem areas that urgently need attention if foreign consumers are to receive perishable U.S. foods of the quality they expect and deserve.

These problem areas are: Refrigerated equipment, packaging, precooling of cargo, proper loading in the container, and temperature management in transit.

Said Mr. Clark, with emphasis, "Perishable foods moving in international trade *cannot* be handled the same as domestic movements!" He explained why. "In the intercontinental movement of perishable foodstuffs, we are not dealing with transit times of 4 to 7 days maximum, such as is the case domestically. We are now moving these perishable commodities over distances involving transit times of as much as 25 to 40 days. Many perishable commodities, in fact, are now in transit longer than their maximum storage life as stated

in agricultural publications of various governments throughout the world. Fresh fruits and vegetables, for the most part, fall under this category. We do not now have the commodity life that allows a slight margin of error in the handling of these sensitive cargoes."

Update refrigeration equipment

"The refrigeration equipment being used today on containers," said Mr. Clark, "is practically identical to what we have been using for 5 to 10 years in refrigerated highway trailers. It must be improved." Many commodities, he pointed out, will not stand temperature changes of 8 to 12 degrees, such as are prevalent today in refrigeration.

Air circulation, too, needs improvement. Controlled atmosphere, according to Mr. Clark, has promise for the future, and under laboratory conditions it has proven its benefit in extending the life of many fresh fruits and vegetables; but it has not been proven under conditions of lengthy transit time, where it could do the most good. Help is needed from the manufacturers in this area.

Improve packaging

Said Mr. Clark, "Improvements in packaging seem to still be in the talking stage." But he acknowledged that various technologists, particularly in the fresh fruit and vegetable industry, were placing more and more emphasis upon this all-important environmental factor.

Here again, manufacturers must help. Packages must be designed so that even when containers are stacked several deep on shipboard and subject to severe rolling and pitching, the product is protected from injury by either bruising or squeezing. The packages must permit temperature management. Commodities differ completely from each other in their rate of "breathing," and the location and size of vents on packages can be vital for improving temperature control in transit. Special requirements such as the handling of a tendency to severe moisture loss must be taken into consideration.

The package must be easy to handle—from storage at origin, through loading, through ocean transit, and in reverse stages at the other side. Some packages cannot be stacked and fastened in pallet loads without harming the product.

All too often, Mr. Clark commented, a shipper seems interested only in the

economics of the package itself; but saving a few cents per package and delivering an inferior product is false economy.

Precool cargo

Probably the most important single item, Mr. Clark feels, is the need for cooling the product down to carrying temperature before loading it into the container. For fruits and vegetables, this is important even during short transit times; but in the extended transit times that intercontinental shipping involves, precooling becomes an operation as important as harvesting. A unit that can efficiently carry a properly cooled product may not necessarily be able to bring down the temperature of a sun-warm product to carrying level while en route.

Load and manage cargo properly

Said Mr. Clark, "Sensitive perishable foods, unlike household appliances, require meticulous care in loading." Frozen foods can be loaded in a single solid mass so long as there is air circulation around the outer perimeter of the cargo. But fresh fruits and vegetables generate their own heat; they must be loaded so as to allow for cool air to circulate not only around but through the load.

Another loading problem is that of mixed loads. Commodities must be compatible in their temperature needs during transit. For example, Mr. Clark quipped that lettuce (which must be kept at 33 to 34 degrees Fahrenheit) and tomatoes (which must be kept at 52 to 58 degrees Fahrenheit) "together make a beautiful salad; however, when loaded in the same container, there is no way of setting the temperature so as to outturn anything short of garbage."

A third loading problem is odor. Commodities that give off or absorb odor should not be loaded together, even though they are compatible in the range of carrying temperature—for example, apples with onions or apples with eggs.

Proper management of temperature in transit really ties all the other items into one, remarked Mr. Clark. For successful movement of perishables in international trade, the carrier involved must set up all the procedures needed to assure that the container is properly serviced before it is sent off for loading and closely watched at regular intervals for its entire time in the carrier's possession—all the way from origin to destination.

(Continued from page 12)

strates its individual functional advantages in using the cities' streets and the country's highways to provide an elastic, adaptable technique in door-to-door delivery.

Our air/truck service has mushroomed; today we have 180 line-haul motor carriers serving 3,700 points, transporting more than 700,000 connecting shipments. We expect our air/truck service to quadruple by 1970 as the population shifts away from high-density areas and as the industry expands into suburban and rural areas. Growth of the interstate highway system will make air/truck even more valuable.

With growth we have our share of problems: Airport congestion, with its economic impact; costs, particularly of labor, showing a modestly sharp increase; capital to invest in equipment, becoming more expensive and difficult to find; the shortage of on-airport real estate; the price of land; ton-mile availability far outpacing revenue growth projection.

These are the positive problems of growth, and we welcome the opportunity to overcome all of them.

CROPS AND MARKETS SHORTS

Weekly Report on Rotterdam Grain Prices

The price of U.S. No. 3 Yellow corn has advanced at Rotterdam, the Netherlands, 4 cents a bushel from the previous week's, in line with higher U.S. domestic prices. Current Rotterdam prices for imported grain, with comparisons with a week earlier and a year ago, are as follows:

Item	May 20	Change from previous week	A year ago
	Dol. per bu.	Cents per bu.	Dol. per bu.
Wheat:			
Canadian No. 2 Manitoba ...	1.94	+1	2.01
USSR SKS-14	1.84	0	1.88
Australia Prime Hard	1.86	+1	(¹)
U.S. No. 2 Dark Northern			
Spring:			
14 percent	1.92	0	1.91
15 percent	1.96	+4	1.96
U.S. No. 2 Hard Winter			
14 percent	1.93	+2	1.82
Argentina	1.80	0	1.88
U.S. No. 2 Soft Red Winter ..	1.71	+1	1.60
Feedgrains:			
U.S. No. 3 Yellow corn	1.50	+4	1.34
Argentina Plate corn	1.57	+2	1.46
U.S. No. 2 sorghum	1.26	-4	1.37
Argentina-Granifero	1.24	-3	1.30

¹ Not quoted.

Note: All quoted c.i.f. Rotterdam for 30- to 60-day delivery.

India's Tea Exports Off

India's tea exports in 1968 totaled 459.5 million pounds, off 2.5 percent from 1967 exports of 471.1 million. The smaller shipments reflected lower sales to the large U.K. market, which took 224.9 million pounds from India in 1968, compared with 256.1 million the year before.

Proposed U.K., Greek Tobacco Pact

According to a report in *The Financial Times* of London, the United Kingdom is negotiating a nuclear power station sale to Greece in exchange for 88 million pounds of Greek tobacco valued at \$60 million. Under the proposed agreement, the tobacco shipments would be distributed over the next 12 years with annual imports of about 7.5 million pounds. This quantity represents about 2.25 percent of total U. K. tobacco imports and about 5.0 percent of Greece's annual exports.

The U. K. tobacco industry has been indicating strong objections to buying Greek tobacco on the grounds that it is unsuitable for the British market. Imports of Greek tobacco in recent years have been insignificant, averaging less than 300,000 pounds annually during the past 10 years.

Ireland Raises Tobacco Duties

On May 7, Ireland announced another increase in customs duties on tobacco imports, the third increase in 13 months.

The increase is equivalent to 41 U.S. cents per pound on the main type of leaf imported and represents similar raises for other types of leaf and manufactured tobacco. The rise in duties has caused an increase of 2 cents in the retail price of a pack of 20 cigarettes. Since 1960 there have been 12 increases in cigarette prices.

Swiss Tobacco Imports Rise

Switzerland's 1968 imports of unmanufactured tobacco rose to a record level of 47.2 million pounds, up from 43.6 million pounds in 1967. In both years the U. S. share represented 45 percent of the total tobacco imports. The rising demand for tobacco is attributed to increasing domestic consumption and expanding exports of Swiss cigarettes.

New Zealand Harvests More Hops

New Zealand's acreage of hops was held at the same level as last year's, when approximately 610 acres were under cultivation. In the current crop year, however, the weather and growing conditions have been much more favorable, and a crop of about 1,040,000 pounds is expected, as compared with only 807,000 last year. If the estimate proves accurate, the crop will have the highest average yield per acre in recent years.

The trade expects that the 1969 crop, in addition to being larger, will be characterized by considerably higher quality and fewer problems of high moisture. Very favorable harvest weather has prevailed throughout the current season, with almost no rainfall during the harvest period.

Import Tender for Iceberg Lettuce

The West German Government has announced that the tender allowing imports of iceberg lettuce from the United States will be extended until June 30, 1969. Applications can be made for renewal of issued import licenses.

Nigerian Cotton Production Rises

Cotton production in Nigeria is placed at 240,000 bales (480 lb. net) in 1968-69 (August-July) rising from a 15-year low of 125,000 bales a year earlier. This year's crop falls below the 1960-61 record of 260,000 bales, but is significantly higher than the 1960-64 average of 213,000.

Average yield this season increased to 128 pounds an acre, nearly double the drought-reduced yield of 67 pounds in 1967-68. Acreage is about at the 1967-68 level of 900,000 acres.

Nigerian exports in 1967-68 are estimated at 100,000 bales, down 25,000 bales from the previous year. Major countries receiving Nigerian cotton in 1967-68 were Italy, the Netherlands, Belgium, the United Kingdom, and France.

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Rm. 5918, Washington, D.C. 20250.

Nigerian consumption of cotton in 1968-69 is estimated at 120,000 bales, up 10,000 bales from a year earlier and continuing the upward trend followed during the past 10 years except for 1965-66, when offtake was slightly lower than the previous year. Stocks on August 1, 1968, were estimated at 40,000 bales, compared with 125,000 the previous August.

Prices paid in 1968-69 to northern farmers by the Northern State Marketing Board were raised about 25 percent, while farmers in the west and midwest received a price increase greater than 25 percent. The higher price increase in the west and midwest was designed to encourage farmers in that area to grow more cotton for the three textile mills located there.

The Government of Nigeria has initiated incentive programs to increase the quantity and quality of raw cotton consumed by domestic mills, as well as programs to promote greater utilization of domestic raw cotton. The Institute of Agricultural Research, Ahmadu Bello University in Zaria, has started research—including pest control, entomology,

breeding, and pest pathology—for a better long staple type and higher producing cotton varieties.

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Taiwan Sets Import Quotas for Wheat, Corn, Soybeans

The Chinese Government has placed maximum limits on imports of wheat, corn, and soybeans to Taiwan for the period April 1—December 31 1969, and has established monthly allocations for designated ports and eligible importers. The ceilings, which are subject to adjustment depending on local supply, were determined after discussions with end-user associations—feed mixers, flour millers and oilseed crushers. The 9-month ceiling for wheat is 460,000 metric tons, for corn 530,000 tons, and for soybeans 490,000 tons. These quantities include imports by both commercial end-users and government agencies.

The end-user associations initially requested higher ceilings but now agree that the quantities are reasonable and that when added to the January-March 1969 total there will not be any significant reduction in what otherwise would have been imported.

In addition to the April-December ceilings, the Board of Foreign Trade of the Ministry of Economic Affairs has issued new regulations for all bulk commodities for which imports

to Taiwan exceed 40,000 metric tons a year. These regulations require the establishment of an annual import plan and group purchases by end-users. Traders are no longer allowed to import bulk commodities in speculation of higher international prices for a commodity.

The import ceilings and new regulations were brought about primarily as a result of port congestion and the straining of port and inland systems for the handling, storage, and transportation systems of bulk commodities.

It is hoped that excessive arrivals of commodities within short periods of time can be avoided in the future by the establishment of an island-wide scheduling of bulk imports. The government is also seeking a better use of foreign exchange by lower ocean transportation costs and better bargaining power with commodity exporters in other countries.

A third reason for the new program is the realization by high government officials that imports of grains and oilseeds are increasing very rapidly and are now costing over US\$100 million a year.